

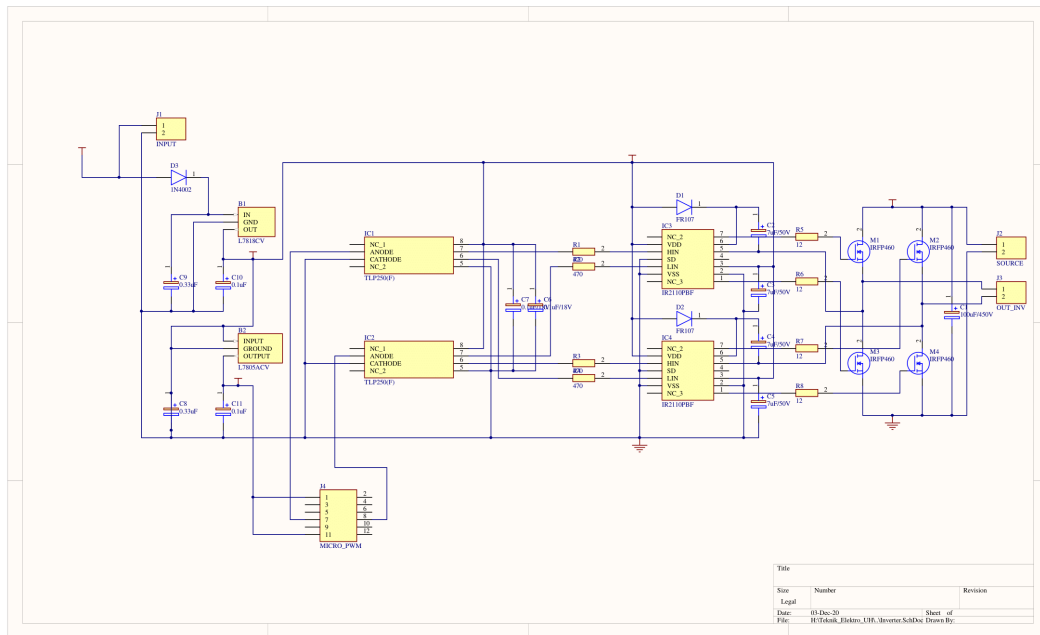
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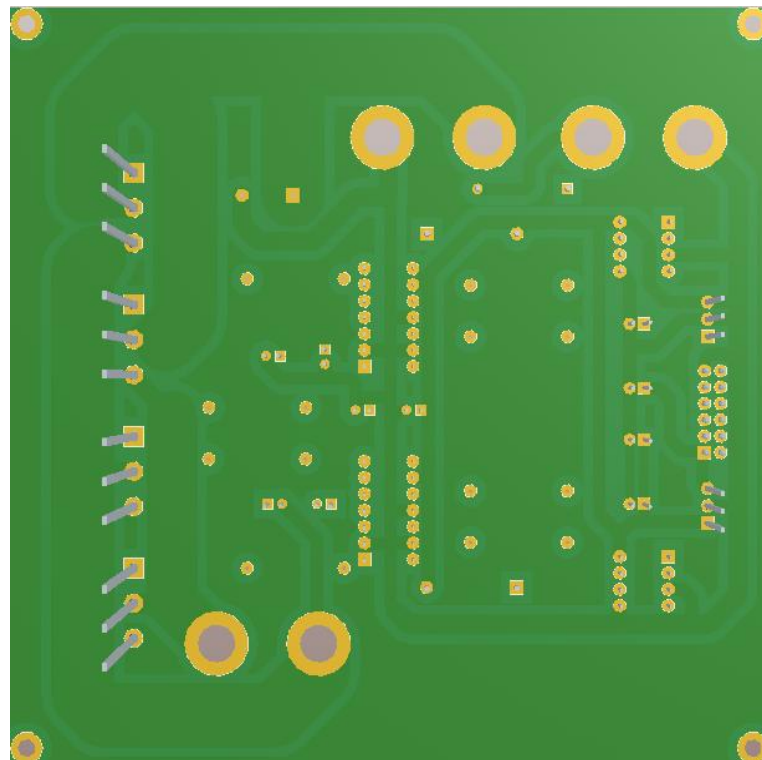
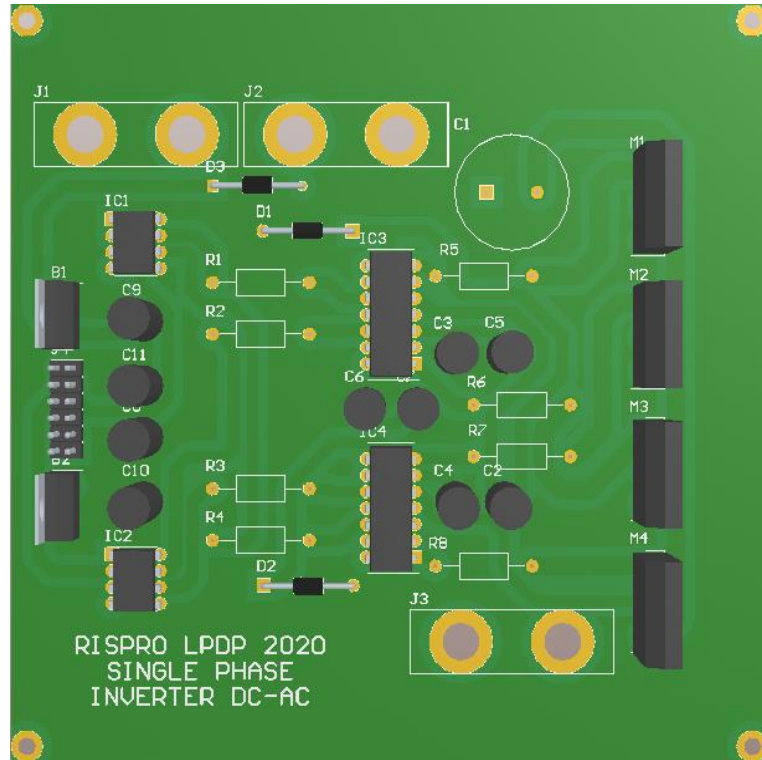
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LAMPIRAN

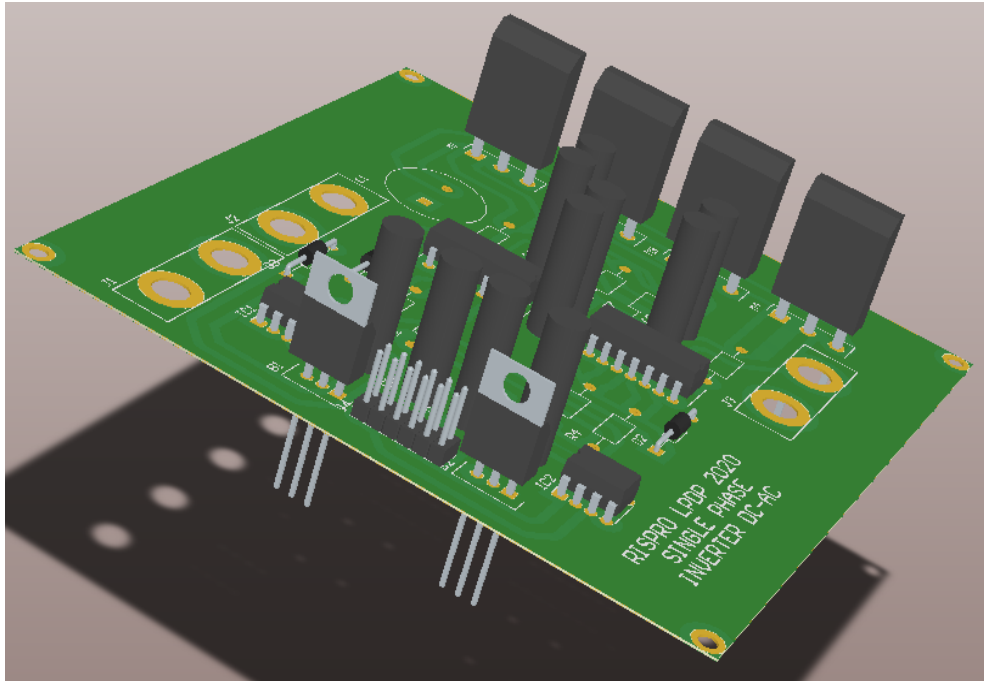
Lampiran 1 Skematik Rangkaian Inverter Satu Fasa



Lampiran 2 Layout PCB Inverter Tampak Depan dan Belakang



Lampiran 3 Tampilan 3D PCB Inverter



Lampiran 4 Coding Program PSpice Inverter Satu Fasa

RANGKAIAN INVERTER

VDD 1 0 DC36V

CS 1 0 100u

***** MOSFET

M1 1 4 2 2 IRFP460

M2 1 5 3 3 IRFP460

M3 2 6 0 0 IRFP460

M4 3 7 0 0 IRFP460

.MODEL IRFP460 NMOS (VTO=2.831 KP=31.2u L=1u W=30m

CGDO=3.358N CGSO=18.054N)

*.MODEL IRFP460 NMOS (VTO=2.831 KP=31.2u L=1u W=30m CGDO=0

CGSO=0)

*.MODEL IRFP460 NMOS (VTO=2.831 KP=31.2u L=1u W=2.97m

CGDO=0.418N CGSO=3.78N)

***** Dioda

D1 2 1 DIN750

D2 3 1 DIN750

D3 0 2 DIN750

D4 0 3 DIN750

.MODEL DIN750 D(Is=880.5E-18 Rs=.25 Ikf=0 N=1 Xti=3 Eg=1.11

Cjo=175p M=.5516

+Vj=.75 Fc=.5 Isr=1.859n Nr=2 Bv=4.7 Ibv=20.245m Nbv=1.6989

+Ibv1=1.9556m Nbv1=14.976 Tbv1=-21.277u)

*D(Is=880.5E-18 Rs =.25 Ikf=0 N = 1 Xti = 3 Eg=1.11

*+Cjo = 175p M=0.5516 Vj=.75 FC = .5 Isr=1.859n Nr=2 Bv=4.7

Ibv=20.245m

*+Nbv = 1.6989 Ibvl= 1.9536m Nbv1=14.976)

***** Pembangkitan pulsa

.PARAM M=0.9 fout=50Hz p=100; p adalah jumlah pulsa spwm

V_mod 16 0 AC 0 SIN (0 {M} {fout} 0 0 0); membangkitkan sinyal sinusoidal
50Hz

E_ABS 15 0 VALUE {ABS(V(16))}; mengabsolutkan gelombang sinusoidal

Vref 14 0 PULSE (1 0 0 {1/(2*{2*p*fout})} {1/(2*{2*p*fout})-1ns} 1ns
{1/{2*p*fout}})

Vx 13 0 PULSE (0 1 0 1ns 1ns {1/(2*{fout})-2ns} {1/{fout}})

```

E_ABM12 12 0 VALUE {1-V(13)} ; Inverting V(13,0)

E_ABM21 11 0 VALUE {IF(V(15)-V(14)>0, 1, 0)} ;membandingkan V(15,0)
dengan V(14,0)

E_MULT1 9 0 VALUE {V(11)*V(13)} ; mengalikan V(11,0) dengan V(13)

E_MULT2 8 0 VALUE {V(11)*V(12)} ; mengalikan V(11,0) dengan V(12)

***** PEMBANGKITAN PULSA SPWM

EG1 4 2 8 0 34

EG3 7 0 8 0 34

EG2 5 3 9 0 34

EG4 6 0 9 0 34

***** Pembangkitan PULSE SWP

*EG1 4 2 18 0 35

*EG3 7 0 18 0 35

*EG2 5 3 19 0 35

*EG4 6 0 19 0 35

*****

*VG1 18 0 PULSE (0 {M} 0 0.1ms 0.1ms 1.8ms 4ms)

*EINVG1 19 0 VALUE {{M} - V(18,0)}

```



```
***** Beban

RLOAD 2 17 6

***** Filter LC

L1 17 18 60mH

C1 18 3 300uF

R1 18 3 600

***** Filter LCL

*L1 2 17 10H

*L2 17 18 8H

*C1 17 3 1uF

***** Filter LLCL

*L1 2 17 5uH

*L2 17 18 5uH

*L3 17 19 5uH

*C1 18 3 5uF

*.STEP PARAM p List 10 20 50 100

.TRAN 0.1ms 200ms 0 0.1ms

.FOUR 50Hz 20 V(3,18)
```

```
.OPTIONS ABSTOL=1uA CHGTOL=0.01nC ITL2=100 ITL4=150  
RELTOL=0.1 VNTOL=0.1  
  
.PROBE V(9,0) V(8,0) V(2,3) V(11,0) V(14,0) V(15,0) V(13,0) V(3,2) V(16,0)  
V(3,17) V(3,18) V(2,17)  
  
.END
```

Lampiran 5 Coding Program SWP Inverter Satu Fasa

```
float port1=9;

float port2=10;

void setup(){

  //Serial.begin(9600);

  pinMode(port1, OUTPUT);

  pinMode(port2, OUTPUT);

}

void loop(){

  //Sesi 1

  digitalWrite(port1, LOW); digitalWrite(port2, LOW);

  delayMicroseconds(0);

  //Sesi 2

  digitalWrite(port1, HIGH); digitalWrite(port2, LOW);

  delayMicroseconds(10000);
```

```
//Sesi 3

digitalWrite(port1, LOW); digitalWrite(port2, LOW);

delayMicroseconds(0);

//Sesi 4

digitalWrite(port1, LOW); digitalWrite(port2, HIGH);

delayMicroseconds(10000);

//Sesi 5

digitalWrite(port1, LOW); digitalWrite(port2, LOW);

delayMicroseconds(0);

}
```

Lampiran 5 Coding Program SPWM Inverter Satu Fasa

```
int x=0; bool en=false;

//int sinus[]={0,127,127,0};

int sinus[]={0,8,16,23,31,39,47,55,63,71,78,86,93,101,108,115,122,129,
136,143,149,156,162,168,174,180,185,191,196,201,206,210,215,219,223,
227,230,234,237,239,242,244,246,248,250,251,252,253,254,254,255,254,
254,253,252,251,250,248,246,244,242,239,237,234,230,227,223,219,215,
210,206,201,196,191,185,180,174,168,162,156,149,143,136,
127,122,115,108,101,93,86,78,71,63,55,47,39,31,23,16,8,0};

void setup(){

TCCR1A = 0b10100010;

TCCR1B = 0b00011001;

TIMSK1 = 0b00000001;

ICR1 = 1600;

TCCR0A=0; TCCR0B=0; //disable millis, delay and mcicroseconds function

sei();
```

```
pinMode(9,OUTPUT); pinMode(10,OUTPUT); //UNO, PRO Mini or NANO

}

void loop(){ //do nothing
}

ISR(TIMER1_OVF_vect){

ICR1 = 1600;

if(++x>99){x=0; en=!en;}

if(en==true){

OCR1A=map(sinus[x],0,255,0,ICR1); OCR1B=0;}

else{OCR1A=0; OCR1B=map(sinus[x],0,255,0,ICR1);}

}
```